

wherein X is selected from the group consisting of Cl, Br, I, OR<sup>10</sup>, SR<sup>14</sup>, SeR<sup>14</sup>, O-N(R<sup>14</sup>)<sub>2</sub>, S-C(=S)N(R<sup>14</sup>)<sub>2</sub>, H, OH, N<sub>3</sub>, NH<sub>2</sub>, COOH and CONH<sub>2</sub> and groups that can be formed therefrom by conventional chemical processes, where

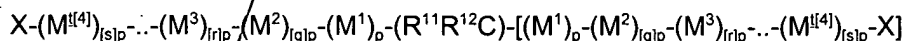
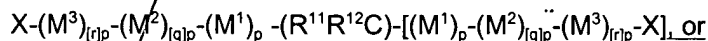
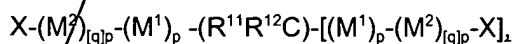
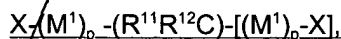
R<sup>10</sup> is an alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R<sup>14</sup> is aryl or a straight or branched C<sub>1</sub>-C<sub>20</sub> alkyl group, and where an N(R<sup>14</sup>)<sub>2</sub> group is present, the two R<sup>14</sup> groups may be joined to form a 5- or 6-membered heterocyclic ring,

R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> are each independently selected from the group consisting of H, halogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>3</sub>-C<sub>8</sub> cycloalkyl, C(=Y)R<sup>5</sup>, C(=Y)NR<sup>6</sup>R<sup>7</sup>, COCl, OH, CN, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl, oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl, aralkenyl, C<sub>1</sub>-C<sub>6</sub> alkyl in which from 1 to all of the hydrogen atoms are replaced with halogen and C<sub>1</sub>-C<sub>6</sub> alkyl substituted with from 1 to 3 substituents selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkoxy, aryl, heterocyclyl, C(=Y)R<sup>5</sup>, C(=Y)NR<sup>6</sup>R<sup>7</sup>, oxiranyl and glycidyl,

where Y is NR<sup>8</sup>, S or O;

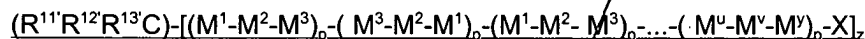
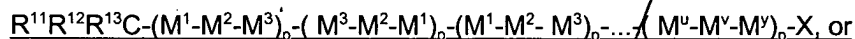
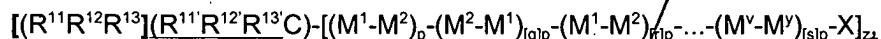
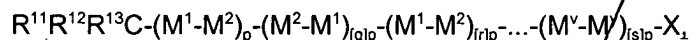
where R<sup>5</sup> is an aryl or an alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, aryloxy or heterocycloxy; and R<sup>6</sup> and R<sup>7</sup> are independently H or alkyl of from 1 to 20 carbon atoms, or R<sup>6</sup> and R<sup>7</sup> may be joined together to form an alkylene group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring, such that no more than two of R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> are H, and R<sup>8</sup> is H, a straight or branched C<sub>1</sub>-C<sub>20</sub> alkyl or aryl, and M<sup>1</sup>, M<sup>2</sup>, M<sup>3</sup>,... up to M<sup>[4]</sup> form a polymer chain and are each a radically (co)polymerizable monomer selected such that the monomers in adjacent blocks are [riot] not identical, and p [, q, r,... up to s are] for each monomer is independently selected such that the number average molecular weight of each block is up to 250,000 g/mol, and t is an integer greater than 3;

the following formulas:



wherein  $R^{11}$ ,  $R^{12}$ ,  $X$ ,  $M^1$ ,  $M^2$ ,  $M^3$ , ... up to  $M^{[4]}$ ,  $t_1$  and  $p$ ,  $q$ ,  $r$ , ... up to  $s$ ] are as defined above, with the proviso that the polymer chain enclosed in square brackets substituted for an original X group on the original  $R^{11}$ ;

of the formulas:



wherein  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $X$  are as defined above, and where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$ , and wherein  $z$  is 2 to 6, with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto,

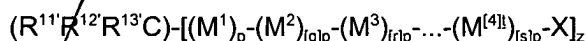
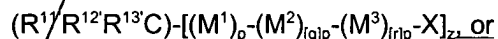
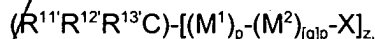
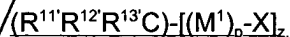
$M^1$ , [and]  $M^2$  and  $M^3$  are different radically-(co)polymerizable monomers, and [ $M^v$  is one of  $M^1$  and  $M^2$  and  $M^v$  is the other of  $M^1$  and  $M^2$ ,]  $M^u$  is one of  $M^1$  or  $M^2$  or  $M^3$  and  $M^v$  is another of  $M^1$  or  $M^2$  or  $M^3$ , and  $M^v$  is the third (co)monomer, and

[ $z$ ]  $z$  is from 2 to 6;

$p$ ,  $q$ ,  $r$ , ... up to  $s$  are] for each monomer is independently selected such that the number average molecular weight of the copolymer is up to 1,000,000 g/mol; and,

(co)polymers of this topology comprising four or more comonomers and,

of the formulas:



where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined contain from 2 to 5 [X groups] of the polymer chains enclosed in square brackets attached

thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, where

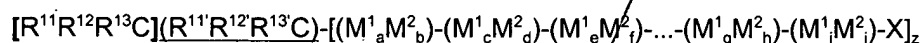
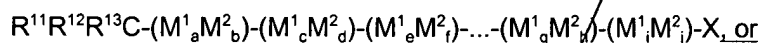
X is as defined above;

$M^1, M^2, M^3, \dots M^{(4)}$ , p, and t are as defined above; and

z is from 3 to 6;

and copolymers comprising a block or graft with the above composition; and

of the formula:

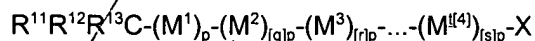
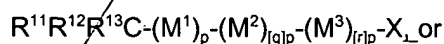
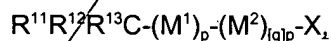
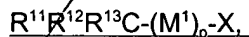


where  $R^{11}, R^{12}, R^{13}$  are as defined above,  $M^1$  and  $M^2$  are different radically-polymerizable monomers which define a polymer chain, z [=] is from 2 to 6 and where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto, and

a, b, c, d, e, f, ... up to i and j are non-negative numbers independently selected such that  $a + b = c + d = 100$ , and any or all of  $(e + f)$ ,  $(g + h)$  and  $(i + j) = 100$  or 0, wherein the a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that  $c < a$  and  $d > b$ , and where applicable, the e:f ratio is from 90:10 to 10:90, such that  $e < c$  and  $f > d$ , and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the [e:f] e:f ratio is from 5:95 to 95:5, such that  $e \neq c$  and  $f \neq d$ , and the i:j ratio is from 0:100 to 100:0, such that  $i \neq e$  and  $j \neq f$ .

38.

(Amended) The (co)polymer of Claim 37, having a formula:



wherein X is selected from the group consisting of Cl, Br, I,  $OR^{10}$ ,  $SR^{14}$ ,  $SeR^{14}$ ,  $O-N(R^{14})_2$ ,

CS  
amt  
S  
N  
P  
6  
amt

S-C(=S)N(R<sup>14</sup>)<sub>2</sub>, H, OH, N<sub>3</sub>, NH<sub>2</sub>, COOH and CONH<sub>2</sub> or a group derived therefrom; and where

R<sup>10</sup> is an alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide, R<sup>14</sup> is aryl or a straight or branched C<sub>1</sub>-C<sub>20</sub> alkyl group, and where an N(R<sup>14</sup>)<sub>2</sub> group is present, the two R<sup>14</sup> groups may be joined to form a 5- or 6-membered heterocyclic ring,

R<sup>11</sup>, R<sup>12</sup> and R<sup>13</sup> are each independently selected from the group consisting of H, halogen, C<sub>1</sub>-C<sub>20</sub> alkyl, C<sub>3</sub>-C<sub>8</sub> cycloalkyl, C(=Y)R<sup>5</sup>, C(=Y)NR<sup>6</sup>R<sup>7</sup>, COCl, OH, CN, C<sub>2</sub>-C<sub>20</sub> alkenyl, C<sub>2</sub>-C<sub>20</sub> alkynyl oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl, aralkenyl, C<sub>1</sub>-C<sub>6</sub> alkyl in which from 1 to all of the hydrogen atoms are replaced with halogen and C<sub>1</sub>-C<sub>6</sub> alkyl substituted with from 1 to 3 substituents selected from the group consisting of C<sub>1</sub>-C<sub>4</sub> alkoxy, aryl, heterocyclyl, C(=Y)R<sup>5</sup>, C(=Y)NR<sup>6</sup>R<sup>7</sup>, oxiranyl and glycidyl,

where Y is NR<sup>8</sup>, S or O,

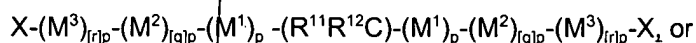
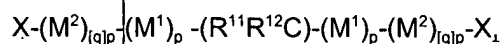
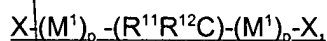
where R<sup>5</sup> is an aryl or an alkyl of from 1 to 20 carbon atoms, alkoxy of from 1 to 20 carbon atoms, aryloxy or heterocycloxy; and R<sup>6</sup> and R<sup>7</sup> are independently H or alkyl of from 1 to 20 carbon atoms, or R<sup>6</sup> and R<sup>7</sup> may be joined together to form an alkylene group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring, such that no more than two of R<sup>11</sup>, R<sup>12</sup>, R<sup>13</sup> are H,

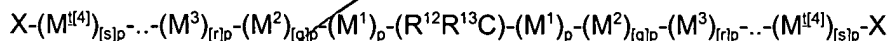
R<sup>8</sup> is H, a straight or branched C<sub>1</sub>-C<sub>20</sub> alkyl or aryl, and

M<sup>1</sup>, M<sup>2</sup>, M<sup>3</sup>,... up to M<sup>[t]</sup> are each a radically (co)polymerizable monomer selected such that the monomers in adjacent blocks are not identical, and p [ , q, r,... up to s are] for each monomer is independently selected such that the number average molecular weight of each block is from 1000 to 250,000 g/mol, and

t is an integer greater than 3.

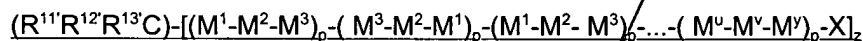
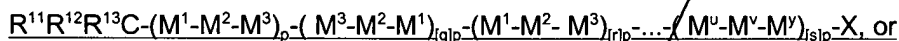
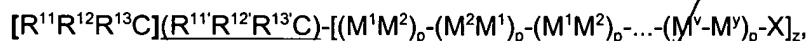
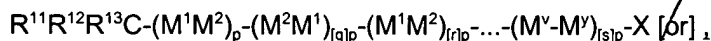
d 34 39. (Amended) The (co)polymer of Claim 37, having a formula:





wherein  $R^{11}$ ,  $R^{12}$ ,  $X$ ,  $M^1$ ,  $M^2$ ,  $M^3$ , ... up to  $M^{[4]}$ ,  $t$ , and  $p$  [  $q$ ,  $r$ , ... up to  $s$ ] are as defined above, with the proviso that the polymer chain enclosed in square brackets substituted for an original  $X$  group on the original  $R^{11}$ .

40. (Amended) The (co)polymer of Claim 37, having a formula:



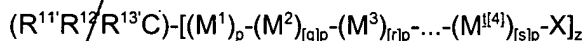
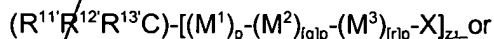
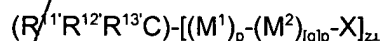
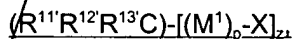
wherein  $z$  is from 2 to 6;

wherein  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$  and  $X$  are as previously defined, and where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$ , with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the  $C$  has only one of the polymer chains enclosed in square brackets attached thereto;

$M^1$ , [and]  $M^2$  and  $M^3$  are different radically-polymerizable or copolymerizable monomers, [and  $M^v$  is one of  $M^1$  and  $M^2$  and  $M^y$  is the other of  $M^1$  and  $M^2$ ] and  $M^u$  is one of  $M^1$ ,  $M^2$  or  $M^3$  and  $M^y$  is another of  $M^1$ ,  $M^2$  or  $M^3$ , and  $M^y$  is the third (co)monomer, [and]

$p$  [  $q$ ,  $r$ , ... up to  $s$  are] for each monomer is independently selected such that the number average molecular weight of the copolymer is from 1,000 to 1,000,000 g/mol; and, (co)polymers of this topology comprising four or more comonomers

41. (Amended) The (co)polymer of Claim 37, having a formula:

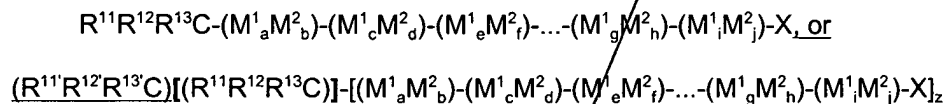


where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  as previously defined, with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined contain from 2 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto [X groups], where X is as defined above;

$M^1$ ,  $M^2$ ,  $M^3$ ,...  $M^{(4)}$ , are as defined above,

z is from 3 to 6, and copolymers comprising a block or graft with the above composition.

42. (Amended) The (co)polymer of Claim 37, having the formulae:

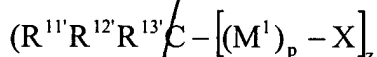
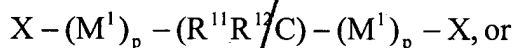
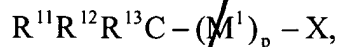


where  $R^{11}$ ,  $R^{12}$ ,  $R^{13}$ , and X are as previously defined,  $M^1$  and  $M^2$  are different radically-polymerizable or (co)polymerizable monomers defining a polymer chain, and where  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  are the same as  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  with the proviso that  $R^{11'}$ ,  $R^{12'}$  and  $R^{13'}$  combined have from 1 to 5 of the polymer chains enclosed in square brackets attached thereto and the C has only one of the polymer chains enclosed in square brackets attached thereto,

and a, b, c, d, e, f,... up to i and j are non-negative numbers independently selected such that  $a + b = c + d = 100$ , and any or all of  $(e + f)$ ,  $(g + h)$  and  $(i + j) = 100$  or 0, wherein the a:b ratio is from 100:0 to 0:100, the c:d ratio is from 95:5 to 5:95, such that  $c < a$  and  $d > b$ , and where [applicable,]  $e \neq 0$  and  $f \neq 0$ , the e:f ratio is from 90:10 to 10:90, such that  $e < c$  and  $f > d$ , and the endpoints of the molar ratio ranges of first monomer to second monomer in successive blocks progressively decrease or increase by 5 such that the e:f ratio is from 5:95 to 95:5, such that  $e \neq c$  and  $f \neq d$ , and the i:j ratio is from 0:100 to 100:0, such that  $i \neq e$  and  $j \neq f$ , and

[z=2-6] z is from 2 to 6.

45. (Amended) A polymer of the formula:



wherein  $M^1$  is a radically polymerizable monomer,

[wherein] X is selected from the group consisting of Cl, Br, I,  $OR^{10}$ ,  $S[R]R^{14}$ ,  $O-N(R^{14})_2$ , S-

$\text{C}(=S)N(R^{14})_2$ , H, OH,  $N_3$ ,  $NH_2$ , COOH and  $CONH_2$ , where

$R^{10}$  is an aryl or an alkyl of from 1 to 20 carbon atoms in which each of the hydrogen atoms may be independently replaced by halide,  $R^{14}$  is aryl or a straight or branched  $C_1$ - $C_{20}$ , alkyl group, and where an  $N(R^{14})_2$  group is present, the two  $R^{14}$  groups may be joined to form a 5- or 6-membered heterocyclic ring,

$R^{11}$ ,  $R^{12}$  and  $R^{13}$  are each independently selected from the group consisting of H, halogen,  $C_1$ - $C_{20}$  alkyl,  $C_3$ - $C_8$  cycloalkyl,  $C(=Y)R^5$ ,  $C(=Y)R^6$ ,  $C(=Y)NR^6R^7$ , COC1, OH, CN,  $C_2$ - $C_{20}$  alkenyl,  $C_2$ - $C_{20}$  alkynyl oxiranyl, glycidyl, aryl, heterocyclyl, aralkyl, aralkenyl,  $C_1$ - $C_6$  alkyl in which from 1 to all of the hydrogen atoms are replaced with halogen and  $C_1$ - $C_6$  alkyl substituted with from 1 to 3 substituents selected from the group consisting of  $C_1$ - $C_4$  alkoxy, aryl, heterocyclyl,  $C(=Y)R^5$ ,  $C(=Y)NR^6R^7$ , oxiranyl and glycidyl, where

Y is  $NR^8$ , S or O;

$R^8$  is H, straight or branched  $C_1$ - $C_{20}$  alkyl or aryl;

Where each p is an integer independently selected such that the number average molecular weight of the polymer is up to 1,000,000 g/mol;

$R^5$  is aryl, alkyl of from 1 to 20 Carbon atoms, alkoxy of from 1 to 20 carbon atoms, aryloxy or heterocyclioxy; and  $R^6$  [arid] and  $R^7$  are independently H or alkyl of from 1 to 20 carbon atoms, or  $R^6$  and  $R^7$  may be joined together to form an alkylene group of from 2 to 5 carbon atoms, thus forming a 3- to 6-membered ring,

such that no more than two of  $R^{11}$ ,  $R^{12}$  and  $R^{13}$  are H,

and claims 1 -14, 46 - 54, 60 and 61 are withdrawn from consideration in the subject application. Upon further consideration, the Examiner withdrew the requirement for an election of species.

### **Specification**

In paragraph 3 of the Office Action, the Examiner objected to the specification because the parameter  $\rho$  on page 49, line 11 and the parameters  $P_i$  and  $P_1$  do not appear to be defined in the specification. Applicants direct the Examiner's attention to footnote 'a' of Table 2 on page 5 where the parameter  $\rho$  is defined as the "persistence ratio." The footnote indicates that  $\rho = 2(m)(r)/(mr)$ . This clearly defines the definition of parameter  $\rho$  in the specification.

Applicants further direct the Examiner's attention to pages 83, line 2, the parameter " $P_i - Cl$ " is defined as the "dormant species." The dormant species is defined earlier and throughout in the specification as  $R - Cl$ . The dormant polymer chain is formed when the catalyst donates the radically transferable atom or group back to the active polymer chain end during the second reaction of the controlled polymerization reaction. The term is also defined on page 83, line 4 as " $P_i^*$ ." " $P_i^*$ " is the active radical formed when the radically transferable atom, in this example " $Cl$ ," is abstracted from the dormant polymer chain, " $P_i - Cl$ ," reforming the active radical polymer chain and allowing additional monomer addition. The nomenclature is generally interchangeable, however, the parameter " $P_i$ " is used to emphasize the fact that the active radical is a polymer chain. The nomenclature indicates that it is a Polymeric initiator and that every polymer chain formed in an active ATRP process is an active initiator for further ATRP reactions.

Applicants respectfully request that The Examiner indicate where in the specification the parameter " $P_i$ " is located. Applicant cannot find the location in the specification. Applicants also note the length of the specification and will cooperate with the Examiner to assist in the correction of any errors of which the Applicants becomes aware.

### **Drawings**

In paragraph 5 of the Office Action, the Examiner objected to Figures 6-8 and 12-14.

With respect to Figures 6-8, the Examiner indicated that the x-axis labels are unclear and/or not properly

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spaced. With respect to Figures 12-14, the Examiner objected to the small font size and poor copy quality. Responsive to these objections, Applicants submit replacement drawing sheets for Figures 6-8, and 12-14 in the subject application which comply with the drawing requirements of Patent Office rules and procedures. As required, the requested amendments to the drawings have been submitted to the Drawing Review Branch, captioned "Amendments of Drawings," for their consideration. A copy of the communication to the Drawing Review Branch, which fully indicates the requested changes, is submitted herewith as exhibit A.

### ***Claim Rejections - 35 U.S.C. Section 112***

In paragraphs 6 and 7 of the Office Action, claims 21-23, 26-28, 30, 31, 33-43, 45 and 55-59 were rejected under 35 U.S.C. § 112, second paragraph, because the Examiner is of the opinion that the claims are indefinite for failing to particularly point out and claim the subject matter which the Applicants regard as the invention. Applicants respectfully submit amendments to the claims to overcome these rejections. Applicants have indicated the deletions of terms from the equations by bolding the deletion brackets to distinguish the deletions from the brackets used in the formulas to indicate the polymer chains.

In paragraph 7 a), the Examiner specifically listed terms for clarification, as follows:

- a. i) *"controlled"* - Applicants have amended claims 21, 28, 34, 37, and 45 to delete the term "controlled" and to add the phrase "of less than 2.0." This amendment finds basis in the specification on, for example, page 42, lines 14 to 18, Table 1 on page 45, as well as numerous locations throughout the specification as filed. In claim 30, Applicants have amended the claim to delete the term "controlled." Applicants have not amended claim 43 to delete the term controlled, see item v below.
- ii) Claims 21 and 22 were amended to delete the phrase "specific identified" and more fully define the phrase "thermally stable."
- iii) Claim 34 has been amended to delete the phrase "an identifiable specific head group."
- iv) Claims 35 and 36 have been amended to delete the phrase ", or calculable,"

v) Applicants disagree with the Examiner's opinion that the terms "predetermined" and "controlled" are indefinite as used in claim 43. The specification on pages 46, 69 through 72, specifically, describe the controlled nature of the molecular weight distribution and the ability to determine the molecular weight. One skilled in the art of polymerization would readily understand these discussions of these discussions and understand that only after the present invention can one prepare graft or comb shaped copolymers in which either or both the backbone polymer or graft copolymer are copolymers prepared from free radically (co)polymerizable monomers with predetermined molecular weight and a controlled molecular weight distribution.

vi) Claims 56 and 57 have been amended to more clearly define the invention.

vii) Claim 58 has been amended to delete the term "solvent resistant."

viii) Claims 37, 38 and 45 have been amended to define "Y". The basis in the specification for this amendment can be found on page 15, line 16.

viii) Claims 37 and 42 were amended to delete the term "applicable" and to more clearly define the invention.

ix) Claim 45 has been amended to include the definitions of M<sup>1</sup> and p. This amendment is supported throughout the claims and description in the specification as filed.

x) The preambles of claims 26, 27 and 33 have been amended to delete the term "symmetrical."

In paragraph 7 b), The Examiner states that the formulas of claims 37, 38, 39, 41, 42, and 45 are not presented in proper Markush format. Applicants have amended these claims to present the optional formula in proper Markush format by separating each member by a comma and including the word "or" preceding the final member complying with the *Manual of Patent Examining Procedure* §2173.05(h) *Alternative Limitations*.

In paragraph 7 c) The Examiner indicates that the claims 37-42 use the feature "..." to indicate intervening members. This is correct and Applicants have amended the claim to more clearly indicate the presence of intervening members.

Applicants have corrected the various typographical errors in claim 37, specifically, in line

27 by deleting the term "riot" and substituting therefor "not," in line 40 by deleting "Z" and substituting therefor "z," in line 57 by amending the phrase "(i+j) 100 or 0" to read "(i+j) = 100 or 0," and in line 61 by deleting "e,f" and substituting therefor "e.f." The Applicants have also amended claim 42 by deleting the phrase "z=2-6" and substituting, as the Examiner recommends "z is from 2 to 6." Finally in claim 45, line 18, Applicants have deleted the word "arid" and substituted therefor "and."

Applicants now consider claims 21-23, 26-28, 30, 31, 33-43,45 and 55-59 to be in condition for further examination for patentability under 35 U.S.C. §102 and §103.

Applicants also recognize Examiner's understanding of the limitation "functional group" and "groups formed by conventional chemistry."

In paragraph 8, claim 44 is rejected under 35 U.S.C. §112, first paragraph because the Examiner is of the opinion that the subject matter which was not described in the specification. Applicants refer the Examiner to page 14, lines 17 and 18 of the specification as filed. The specification discloses that the present invention provided various controlled copolymers, including . . . hyperbranched and dendritic (co)polymers. Therefore, this claim should not be deemed to contain new matter and need not be canceled from the present application.

#### ***Claim Rejections - 35 U.S.C. Section 103***

In paragraph 9 and 10, Claims 24, 25, and 32 are rejected under 35 U.S.C. §103 because the Examiner believes they are unpatentable over US 5,610,250 ("Veregin"). The Examiner in the Office Action states that "[a]lthough unexemplified patentee provides clear disclosure of a method of making the claimed polymer as col. 14, line 42 through col.15, line 22" and the Examiner is also of the opinion that the disclosed method is similar to that of the instant disclosure in that the growing polymer chain is living or pseudo living and have an initiator fragment at one end and another functional group at the other end.

Applicants respectfully disagree. Certain basic considerations apply to obviousness rejections. The Manual of Patent Examining Procedures ("MPEP") describes the following tenets of patent law which must be adhered to:

(A) The claimed invention must be considered as a whole;

(B) The references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination;

(C) The references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and

(D) Reasonable expectation of success is the standard with which obviousness is determined. *MPEP* §2141, citing *Hodosh v. Block Drug, Inc.*, 786 F.2d 1136, 1143 n.5, 229 U.S.P.Q 182, 187 n.5 (Fed. Cir. 1986).

The Examiner indicates that though unexemplified the patentee provides clear disclosure of a method of making the claimed polymer. The Examiner continues that the disclosed method is similar to that of the instant disclosure in that the growing polymer chain is living or pseudo living. Applicants submit herewith an article, Polymer Reprints 38(1) 454-455 April 1997, authored by the three inventors of Veregin wherein they state the disclosure of Veregin cited by the Examiner is not enabling for the production of block copolymers. (See Exhibit B). Based on the admissions in the enclosed article, Applicants had no reasonable expectation of success of preparation of the polymers disclosed in the subject application. The method disclosed in Veregin of producing styrene/acrylate block copolymers does not produce polymers similar to the claimed polymers nor does it render the claimed polymers obvious. This is shown by the objective evidence in the enclosed article written by three (3) of the inventors listed on Veregin. The article clearly indicates that the method disclosed in Veregin did not enable one skilled in the art to produce the polymers. The article indicates that prior to the disclosure in this article, the stable free radical polymerization process could not be used to polymerize acrylates and, specifically on page 454, column 1, line 18, the article states that "[c]hain extensions reactions with acrylate using TEMPO-terminated polystyrene macroinitiators, which had been repeatedly been used for chain extensions with styrene, *also proved unsuccessful.*" (emphasis added.) The summary of the article states that the problem has been resolved in the article dated April 1997 and that a better understanding of the mechanism of the acrylate polymerization allowed reaction conditions to be chosen that "*enabled* the reaction to proceed successfully." Therefore, the reaction was not previously enabled. The effective date of the subject application is prior to the disclosure of this article and is not prior art.

The MPEP states in §2144.08 B. that a conclusion of obviousness requires that the reference(s) relied upon be enabling in that it put the public in possession of the claimed invention. The MPEP quotes *In re Hoeksema*:

Thus, upon careful reconsideration it is our view that if the prior art of record fails to disclose or render obvious a method for making a claimed compound, at the time the invention was made, it may not be legally concluded that the compound itself is in the possession of the public. [footnote omitted.] In this context, we say that the absence of a known or obvious process for making the claimed compounds overcomes a presumption that the compounds are obvious, based on close relationship between their structures and those of the prior art compounds. *In re Hoeksema* 399 F.2d 269, 274, 158 U.S.P.Q. 596, 601 (CCPA 1968).

It is clear that at the time of the disclosure, Veregin could not disclose or render obvious the method for making the claimed compound. The inventors themselves admit that further experimentation and invention was required in order to produce the claimed compounds. Therefore, according to the legal precedent set in *In re Hoeksema*, since there is an absence of a known or obvious process in the prior art of record in the present application for making the claimed compounds, the claimed compounds cannot be found to be obvious.

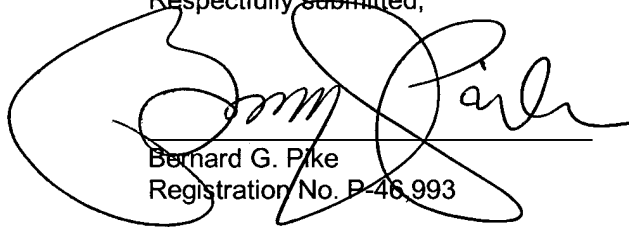
#### ***Double Patenting***

In paragraphs 11 and 12 of the Office Action, Claim 29 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 6 and 8 of U.S. Patent No. 5,789,487. Applicants submit herewith a terminal disclaimer to overcome the rejection as recommended by the Examiner. The terminal disclaimer is enclosed as Exhibit C.

**CONCLUSION**

In view of the foregoing amendments, Applicants respectfully submit that the subject application is in condition for further examination and allowance. Such action at an early date is respectfully requested. Should the Examiner have any remaining concerns regarding the application's claims, he is requested to contact the undersigned at the telephone number below so that those concerns may be addressed in an interview with the Examiner. In addition, should the Examiner deem that there remain grounds outstanding for objecting to the Subject Application, as amended herein, Applicants respectfully request that any subsequent action objecting to the Subject Application not be made final.

Respectfully submitted,



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